REMARKS

This Amendment is responsive to the Office Action mailed August 25, 2008. Claims 1-4 are pending. Claim 1 has been amended. No new matter has been added.

Information Disclosure Statement

Applicants thank the Examiner for considering the Information Disclosure Statement filed on November 9, 2007, and for indicating such consideration by including an initialed copy of the Form PTO-1449 submitted therewith in the Office Action mailed August 25, 2008. The Office Action notes that a copy of the "ASM Specialty Handbook – Stainless Steels" reference was not included in the IDS. Applicants submit that a copy was provided but erroneously scanned together with the document "EP 1186351 A1". Applicants enclose a copy of this document with the Response and submit that the ASM document is available for consideration. Applicants respectfully request that the Examiner indicate such consideration by including an initialed copy of the Form PTO -1449.

Claim Rejections - 35 U.S.C. § 102(b)

The Office Action rejects claims 1-4 as allegedly anticipated by KOBAYASHI et al. (WO 03/044237). This rejection is respectfully traversed.

Initially, it is respectfully submitted that the Office Action does not set forth a proper anticipation rejection. The cited document does not disclose each and every element as set forth in the claim, as is required for a proper rejection under 35 U.S.C. § 102(b). Specifically, the cited document does not provide for a casing material for austenitic stainless steel comprising oxygen in a mass percent not exceeding 0.005 %.

Applicants note that claim 1 has been amended to recite:

1. (Currently amended) A casing material for a storage cell being made of an austenitic stainless steel comprising C: not more than 0.03 mass%, Si: 0.01-0.50 mass%, Mn: not more than 0.20 mass%, P: not more than 0.04 mass%, S: not more than ~~0.0010~~ 0.0005 mass%, Ni: 20.0-40.0 mass%, Cr: 20.0-30.0 mass%, Mo: 5.0-10.0 mass%, Al: 0.001-0.10 mass%, N: 0.10-0.50 mass%, Ca: not more than 0.001 mass%, Mg: 0.0001-0.0050 mass%, O: not more than 0.005 mass%, provided that contents of Cr, Mo and N satisfy a relation of the following equation (1), and the balance being substantially Fe and inevitable impurities, in which a content of CaO as an oxide inclusion in steel is not more than 20 mass%:

$$Cr+3.3\times Mo+20\times N \geq 43 \text{ .....(1)}$$

(wherein each content of Cr, Mo and N is represented as mass%).

Support for this amendment is found at least at Table 1 of the Specification. Applicants submit that the amendment renders the rejections of record moot and respectfully request withdrawal of the rejections.

Applicants respectfully note that the material of the pending claims is directed to a casing material used in a coin-type storage cell such as small-size, large capacity electric double-layer capacitors or the like. The material has sufficient corrosion resistance and strength even under a charging environment of a high voltage exceeding 2.8 V and is capable of decreased thicknesses. (See Specification as published as US2007/0065717, ¶ 0005).

Applicants further note that in the casing material of the claims, corrosion resistance of the steel can be considerably improved by controlling the inclusion of MnS, CaO, and O as per the pending claims. Applicants further note that through controlling these inclusions, thickness of the material can be made thinner and the strength higher.

Applicants note that KOBAYASHI is directed to a stainless steel suitable for use in a food manufacturing plant and does not teach or suggest an S content of not more than 0.0005 mass% and an O content of not more than 0.005 mass %. Applicants further note that controlling an amount of S, CaO, and O, as disclosed by the present Specification at least at ¶¶ 0018 and 0055, is generally not preferred by KOBAYASHI, which discloses a relatively high S content. (See KOBAYASHI, Table 2).

For at least these reasons, the cited document does not recite each and every element of claim 1. Applicants respectfully request withdrawal of the rejection.

The rejection of claim 2 is also respectfully traversed, Applicants respectfully submit that the recitation of

"material having a hardness of not less than 280 HV" is <u>not</u> an inherent feature of the material of the cited document. As discussed above, the cited document does not disclose or suggest each and every element set forth by claim 1 of the pending application. For example, the cited document does not provide a reference or suggestion as to the hardness of the material of its disclosure nor does the Office Action provide guidance for achieving such hardness, wherefore, as Applicants submit with respect to claim 1, the cited document does not recite each and every element of the pending claims.

With respect to the allegation in the Office Action that the cold rolling recitation is not germane to the issue of patentability of the device because it describes a method of forming the

device (Office Action, pg 3), Applicants respectfully submit that the recitation imparts a physical, structural characteristic to the material which results from the recited processing and Applicants respectfully request that the feature be considered inasmuch as it is a resulting difference in the material. The recitation of "material having a hardness of not less than 280 HV" is a description of the structural feature imparted by "a second cold rolling at a rolling reduction of 15-25% after a final anneal". "The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product." See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)(emphasis added).

For at least these reasons, in addition to its dependencies from claim 1, Applicants submit that claim 2 is not anticipated by the cited document.

Claim 3 depends from and inherits all the limitations of claim 1. Claim 4 depends from and inherits all the limitations of claims 1 and 2. In view of the amendment to claim 1, Applicants submit that claims 3 and 4 are not anticipated for at least the same reasons. Applicants respectfully submit that the pending claims are patentable over the cited document and request that the rejections of claims 1 - 4 be withdrawn.

CONCLUSION

For at least the foregoing reasons, it is respectfully submitted that all pending claims are patentably distinct over the documents employed in the rejection of record. Applicants request reconsideration and withdrawal of the rejections of record. Allowance of the application with an early mailing date of the Notices of Allowance and Allowability is therefore respectfully requested.

No additional fee is believed due at this time. If, however, any additional fee is necessary to ensure consideration of the submitted materials, the Patent and Trademark Office is hereby authorized to charge the same to Deposit Account No. 19-0089.

Any comments or questions concerning this application can be directed to the undersigned at the telephone number given below.

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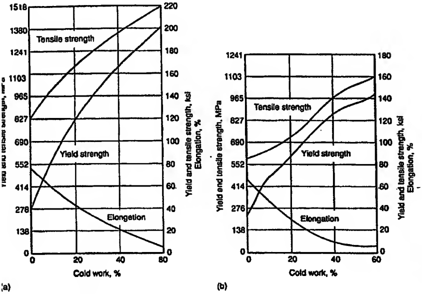

:ig. 2 Effect of cold working on mechanical properties of stainless steels. (a) Type 301. (b) Type 305

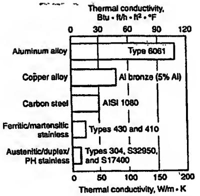

Fig. 3 Comparison of thermal conductivity for carbon steel, copper alloy, aluminum, and stainless steels

ents as well as very low nitrogen contents. Stabi-izing elements such as titanium and niobium can »e added to prevent sensitization and to improve is-welded properties.

Austenitic stainless steels constitute the argest stainless family in terms of number of al-oys and usage. Like the ferritic alloys, they can-not be hardened by heat treatment. However, their similarity ends there. The austenitic alloys are nonmagnetic, and their structure is face-centered-cubic (fcc), like that of high-temperature (900 to 1400 °C, or 1650 to 2550 °F) iron. They possess excellent ductility, formability, and toughness, even at cryogenic temperatures. In addition, they can be substantially hardened by cold work.

Although nickel is the chief element used to stabilize austenite, carbon and nitrogen are also used because they are readily soluble in the fcc structure. A wide range of corrosion resistance can be achieved by balancing the ferrite-forming elements, such as chromium and molybdenum, with austenite-forming elements.

Austenitic stainless steels can be subdivided into two categories: chromium-nickel alloys, such as S30400 and S31600, and chromium-manganese-nitrogen alloys, such as S20100 and S24100. The latter group generally contains less nickel and maintains the austenitic structure with high levels of nitrogen. Manganese (5 to 20%) is necessary in these low-nickel alloys to increase nitrogen solubility in austenite and to prevent martensite transformation. The addition of nitrogen also increases the strength of austenitic alloys. Typical chromium-nickel alloys have tensile yield strengths from 200 to 275 MPa (30 to 40 ksi) in the annealed condition, whereas the high-nitrogen alloys have yield strengths up to 500 MPa (70 ksi).

As previously mentioned, austenitic alloys can be substantially hardened by cold working. The degree of work hardening depends on the alloy content, with increasing alloy content decreasing the work-hardening rate. Figure 2 depicts the higher work-hardening rate of type 301 (7% Ni) versus that of type 305 (11.5% Ni), which is primarily due to its lower nickel content. Austenitic stainless steels that have a low alloy content, such as S20100, S20161, S30100, and S30400, often become magnetic because of the transformation to martensite when sufficiently cold worked or heavily deformed in machining or forming operations. The rapid work hardening of S20161 is a major advantage in sliding wear. In S30430, copper is intentionally added to lower the work-hardening rate for enhanced headability in the production of fasteners.

Another property that depends on alloy content is corrosion resistance. Molybdenum is added to S31700 and S31600 to enhance corrosion resistance in chloride environments. High-chromium grades (S30900 and S31000) are used in oxidizing environments and high-temperature applications, whereas a high-nickel grade (N08020) is used in severe reducing acid environments. To prevent intergranular corrosion after elevated-temperature exposure, titanium or niobium is added to stabilized carbon in S32100 or S34700. Also, lower-carbon grades (AISI L or S designations), such as S30403 (type 304L), have been established to prevent intergranular corrosion. Some of the more corrosion-resistant alloys, such as N08020 (20Cb-3), have nickel levels high enough (32 to 38% Ni) to rate classification as nickel-base alloys. Alloys containing nickel, molybdenum (~ 6%) and nitrogen (~ 0.20%) are sometimes referred to as superaustenitics (Fig. 1).

Martensitic stainless steels are similar to iron-carbon alloys that are austenitized, hardened by quenching, and then tempered for increased ductility and toughness. These alloys are magnetic, and their heat-treated structure is body-centered tetragonal (bct). In the annealed condition, they have a tensile yield strength of about 275 MPa (40 ksi) and are generally machined, cold formed, and cold worked in this condition.

The strength obtained by heat treatment depends on the carbon content of the alloy. Increasing carbon content increases strength but decreases ductility and toughness. The most commonly used alloy in this family is S41000, which contains about 12% Cr and 0.1% C. This alloy is tempered to a variety of hardness levels, from 20 to 40 HRC. Both chromium and carbon contents are increased in alloys S42000, S44002, S44003, and S44004. The first of these contains 14% Cr and 0.3% C and has a hardness capability of 50 HRC. The other three alloys contain 16% Cr and from 0.6 to 1.1% C. These alloys are capable of 60 HRC and a tensile yield strength of 1900 MPa (280 ksi). The amount of primary carbides increases with increased carbon content in these three alloys.

Wear resistance for martensitic stainless steels is very dependent on carbon content. S44004 (1.1% C) has excellent adhesive and abrasive wear, similar to tool steels, whereas S41000 (0.1% C) has relatively poor wear resistance. The key to adhesive wear resistance is a high hardness. Abrasive wear resistance requires both high hardness and primary carbides.

Molybdenum and nickel can be added to martensitic stainless steel to improve corrosion and toughness properties. Nickel also serves to maintain the desired microstructure, preventing excessive free ferrite when higher chromium levels are used to improve corrosion resistance. However, the addition of these elements is somewhat restricted because higher amounts result in a microstructure that is not fully martensitic.

Precipitation-hardenable (PH) stainless steels are chromium-nickel grades that can be hardened by an aging treatment. These grades are classified as austenitic (such as S66286), semi-austenitic (such as S17700), or martensitic (such